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ABSORBENT NAPKIN FOR FEMALE URINARY INCONTINENCE

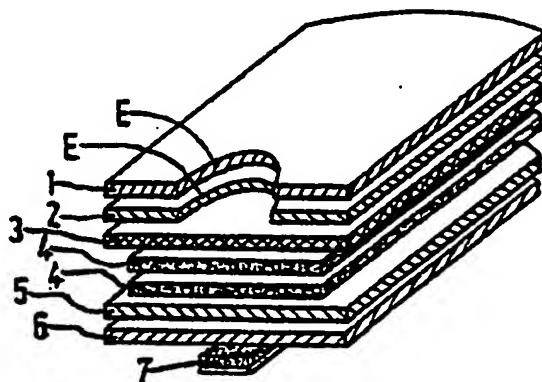
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[Abstract]

The present invention relates to an absorbent napkin for female urinary incontinence.

The napkin is made up of a sequence of layers, the absorbent layer being overlaid by an impermeable layer perforated with a hole and isolated from the lower layer by a completely

impermeable layer, with upper porous layers distributing the liquid. These layers are connected together.



The present invention relates to an absorbent napkin for female urinary incontinence.

It is known that a number of women suffer from a urinary incontinence syndrome of various types. It can be incontinence because of an urgent need to urinate, in which there is an emission of urine without a preliminary wish to urinate, or stress incontinence due to the loss of effectiveness of the means of bladder closure, or else continual incontinence in which the leakage of urine is continuous. To the knowledge of the applicant, no specific equipment for collecting these inadvertent urine leakages is available to women. Various outfits are used which are poorly suited or created for other purposes; thus, menstrual linings, which are certainly sometimes presented as being usable in cases of urinary incontinency, or else diapers for babies or adults, or even urinary catheters introduced through natural passages and connected to a collection container. These products are the object of a certain number of French as well as foreign patents, for example: FR-A-1 445 658 and 2 499 371, GB-A-1 559 275, JA-A-2 498 447, US-A-2 496 456, 2 479 684, 2 437 842, 2 350 828, 2 248 017 and US-A-3 665 920 and Belgian 893 697.

All these devices which are poorly suited have various non-negligible disadvantages; the need to change conventional sanitary napkins which have a low capacity and low power of retention under the effect of the pressure of a very fluid liquid, not to mention the consequences of too slow a speed of absorption of the urine, which is a non-viscous liquid like menstrual blood; or the aesthetic problems due to the volume of the diapers which prohibit women from wearing anything but full clothing; or the risks of infection of the urinary passages with the use of catheters, of the urogenital passages due to the presence of a non-sterile foreign body, and of prolonged soaking in contact with the urine, or more simply the discomfort and even the risk of wounds or irritation during movements (walking) due to the fact that the known devices do not

optimally fit the morphology of all urinary incontinent patients, given the great variation of the perineovulvar ratio from one woman to another.

The device according to the present invention is particularly advantageous because it does not have any of the disadvantages mentioned in the preceding, particularly because of the presence of a non-absorbent layer over the absorbent layer, facilitating distribution of the liquid over the whole surface of the latter in spite of a limited zone of emission.

This napkin is characterized by constituents which make it a very effective element of absorption for a low volume making it unobtrusive, and by a shape which is suited to the female anatomy. Its structure eliminates to the best possible extent leakage of liquid under the effect of pressure, and the effects of soaking.

Another advantageous aspect of the invention is that this napkin, because of its structure and the appropriate choice of the absorbent product which it contains, can be used for the 3 types of urinary incontinence, to the same advantage, even though the urinary volumes and flow rates are quite different depending on the type of incontinence.

In order to better understand the invention, represented in Figure 1 is the whole napkin and represented in Figure 2 is an exploded cross section of it.

The napkin has a shape designed so that it can slide between the thighs of the patient and be applied to the pubic area and so that the majority of the urine is absorbed outside the zones of maximum compression due to the weight and movement of the body of the patient. This shape is elongated, ranging from a rectangle indented to varying degrees, to a triangle with rounded angles in order to prevent irritation of the skin and discomfort of the patient. The dimensions of the napkin are variable but must make it impossible for it to exceed the zone of the perineum of the patient so that the buttocks do not rest on it when the patient is seated, and furthermore, for it not to form folds between the thighs. The length will be approximately 150 to 300 mm, the largest width 50 to 200 mm, while in the narrow part, the width will be 40 to 100 mm.

This napkin is made up of a sequence of at least 6 layers of material whose nature and properties are given in detail hereafter. An oval shaped hole can be made in the upper layer right over the second layer and at a place in the napkin such that it is located at the zone of the urinary meatus of the woman when the napkin is in place.

The first layer [(1) – Figure 2], which is intended to be in contact with the body of the patient, is made of non-woven fabric, which has or has not undergone a treatment making it water repellent and which may or may not be adhesive on the inner side of the napkin in order to connect it with the next layer. This layer is therefore cut with a hole (E, Figure 2) except when one uses a very porous non-woven fabric which allows the liquids to pass without becoming impregnated with them, such as, for example, the 100% Bemberg® non-woven material, at

18 g/m<sup>2</sup>, which is cellulose regenerated by a cupro-ammoniacal salt and marketed by Dupont de Nemours.

The second layer [(2) – Figure 2] consists of a plastic film which is impermeable to liquids, which is always cut with a hole according to an oval (E – Figure 2), [at] a place such that when the napkin is correctly positioned, the cut-out is in the zone of urinary meatus of the woman. This film prevents back flow of any liquid even under high pressure.

The nature of this plastic film can be quite varied, such as polyethylene, polypropylene, polyvinyl chloride, or a polyethylene + polyvinylidene chloride + EVA complex.

If the upper layer is not adhesive, the plastic film may or may not have its side in contact with the non-woven material. It can also have adhesive on both sides or on the lower side in order also to connect it to the third layer.

The first and second layers can also be one and the same if one uses not the non-woven fabric and plastic film sequence but rather a composite fabric produced by layering of a plastic film, for example, made of polyethylene, and a non-woven fabric. It is quite obvious that in this case, the [plastic film] layer is always cut with a hole.

The hole possessed by the second layer and sometimes the first layer has dimensions which allow it to fit all shapes of urinary meatus, and which [dimensions] are a function of the materials composing the napkin; the elongation and size of the perforation will thus vary. Furthermore, the zone around the opening can be provided with an adhesive in order to connect the first two layers if they are not connected by another means.

The third layer [(3) – Figure 2] consists of a porous non-woven film which limits the rise of liquid through the hole zone of the impermeable film, and which distributes the entering urine over the whole underlying absorbent surface. The nature and grams per square meter value of the fibers of this non-woven material can be quite varied: polyester, rayon or a mixture of them are suitable, and the grams per square meter values of 20 to 75 g/m<sup>2</sup> are suitable, for example, 20, 37, 59, 72.

A fourth layer [(4) – Figure 2] consists of a special absorbent material with a large capacity and a high speed of absorption. This absorbent surface has a great power of retaining fluids under the effect of pressure and has a very high speed of dissemination of the moisture.

The material will be a conventional absorbent material, such as wood pulp, or a super-absorbent material, based on sodium carboxymethylcellulose which is made insoluble, based on polyacrylates or other treated natural or synthetic products.

The super-absorbent materials will be used – in the form of a powder embedded in a binding pulp, in a structure in the form of ribbing or networks of open cells (in honeycomb form) – in the form of sheets of non-woven material or paper in which it is trapped by embossing or hot

rolling, such as, for example, Sapsheet® of Sanyo Chemical Industries Ltd., Permasorb Sheet Laminate® of National Starch and Chemical Corporation.

A fifth layer [(5) – Figure 2], an impermeable plastic film which prevents diffusion of liquid into the underlying layer and, like the film of the second layer, [but] without a hole.

A sixth layer [(6) – Figure 2] made of non-woven fabric forming the lower external part of the napkin, which can be made in the manner of the film of the upper layer but quite obviously without a perforation. Under the sixth layer, it is possible to add an adhesive part making it possible to attach the napkin to an undergarment. It is possible to use a double sided adhesive, one side of which is stuck on the lower layer of the napkin and the other side of which is protected by a silicone coated paper which is removed at the time of attachment on the undergarment. Anti-skid products deposited in zones over an axis of the napkin can also be used. One or another can be deposited in a continuous manner or not over the longitudinal axis of the napkin, or else in the form of transverse strips.

The assembling of the various layers will be done by peripheral bonding with heat [or] ultrasound, or sticking by means of an adhesive tape, a transfer adhesive or Hot Melt [(8) – Figure 1] or any other appropriate method as a function of the chosen materials.

In general, the absorbent layer will not be attached to the other layers so that when it is gorged with urine and expands, it does not cause traction with risk of separation of the layers. Advantageously, one will also not attach the intermediate layer between the absorbent layer and the upper impermeable layer, in order to prevent leakage of urine at the site of the assembling zone and in order to promote the passage of the urine at the periphery of the absorbent layer.

In the following, 2 examples of an absorbent napkin according to the invention are described:

### Example 1

The general shape is that represented in Figure 1; this model is 200 to 250 mm long, 100 to 130 mm wide in its upper part, and 60 to 80 mm wide in the narrowest zone. The thickness of the finished napkin is less than 10 mm but can range up to 25 mm when it is gorged with urine.

The hole is a disk with a diameter of 35 to 45 mm or an ellipse with diameters of 30 to 40 mm and 65 to 75 mm. Its center is 70 to 80 mm from the upper edge of the napkin. The non-woven fabric which is used for the first and sixth layers is 100% polyester, at 41 g/m<sup>2</sup>, of Flannel (registered trademark) style, treated so as to be water repellent.

The plastic films [(2) and (5)] are made of polyethylene 20 µm thick, which ensures a very light weight and great flexibility. They are non-adhesive but connected with the two non-woven fabrics (1) and (6) by layering beforehand, absorbent layer 4 is composed of a fabric filled with super-absorbent material based on sodium carboxymethylcellulose which is made

insoluble, having 200 to 400 g/m<sup>2</sup> of super-absorbent material (manufacturer: Enka BV product group industrial colloids).

The assembling is carried out by ultrasound bonding of the layers excluding the absorbent layer, (that is to say (1) + (2) + (3) + (5) + (6), Figure 2) over a width of 2 to 4 mm, leaving a free peripheral border of 2 to 4 mm [(8) – Figure 1]. In a variant, non-woven layer (3) is not taken in this bonding. The super-absorbent layer is trapped in the other layers in such a way that when it expands by absorption of urine, it does not cause traction on the bonded films.

Finally, an adhesive [(7) – Figure 2] of the type commonly found on menstrual napkins is attached to the lower side.

### Example 2

The general shape is that represented in Figure 1: this model is 200 to 250 mm long, 100 to 130 mm wide in its upper part, and 60 to 80 mm wide in the narrowest zone. The thickness of the finished napkin is less than 10 mm but can range up to 25 mm when it is gorged with urine.

The hole is a disk with a diameter of 35 to 45 mm or an ellipse with diameters of 30 to 40 mm and 65 to 75 mm. Its center is 70 to 80 mm from the upper edge of the napkin. The non-woven fabric which is used for the first and sixth layers is 100% Bemberg®, at 18 g/m<sup>2</sup>, and the first layer is not perforated in its center.

The plastic films ((2) and (5)) are made of polyethylene 20 µm thick, which ensures a very light weight and great flexibility. They are non-adhesive but connected with the two non-woven fabrics (1) and (6) by layering beforehand, absorbent layer 4 is composed of a fabric filled with super-absorbent material based on sodium carboxymethylcellulose which is made insoluble, having 200 to 400 g/m<sup>2</sup> of super-absorbent material (manufacturer: Enka BV product group industrial colloids).

The assembling is carried out by gluing at the periphery of the layers, but a distance away of 2 to 4 mm for layers ((1) + (2) + (5) + (6) Figure 2), that is to say leaving the absorbent layer and the Bemberg® layer free.

The exterior surface of layer 6 is completely coated with an anti-skid product commonly used in the technology.

### Claims

1. An absorbent napkin for female urinary incontinence, characterized by the fact that it is not very thick and its shape is suited to the female anatomy, and that it is made up of different layers, in such a way that the absorbent layer is overlaid by a non-absorbent layer facilitating distribution of the liquid over its whole surface, which is itself overlaid by an impermeable layer

perforated with a hole which is situated in such a way that it is facing the urinary meatus when the napkin is worn by the patient.

2. An absorbent napkin according to Claim 1, characterized by the fact that there is moreover a completely impermeable layer under the absorbent layer.

3. An absorbent napkin according to Claim 1 or 2, characterized by the fact that it has a layer made of fabric over the impermeable layer.

4. An absorbent napkin according to Claim 3, characterized by the fact that the layer is made of porous, non-water repellent fabric.

5. An absorbent napkin according to one of Claims 1 to 4, characterized by the fact that the absorbent layer is made up of super-absorbent materials.

6. An absorbent napkin according to one of Claims 1 to 5, characterized by the fact that the super-absorbent material is sodium carboxymethylcellulose which is made insoluble, presented in the form of a powder embedded in a pulp or trapped in sheets.

7. An absorbent napkin according to one the preceding claims, characterized by the fact that the upper layer and the underlying impermeable layer are in the form of a single perforated layer made up of a composite fabric based on non-woven fabric and plastic.

8. An absorbent napkin according to Claims 3 and 5 to 7, characterized by the fact that the upper layer made of non-woven fabric, which is water repellent or not, is perforated in the manner of the underlying impermeable layer.

9. An absorbent napkin according to any one the preceding claims, characterized by the fact that under the impermeable layer, there is a layer made of non-woven fabric which can carry an adhesive part for attachment of the napkin to an undergarment.

10. An absorbent napkin according to any one the preceding claims, characterized by the fact that the non-absorbent layer between the absorbent layer and the upper impermeable layer is made of non-woven fabric.

11. An absorbent napkin according to any one the preceding claims, characterized by the fact that the different layers, with the exception of the absorbent layer, are connected.

12. An absorbent napkin according to any one the preceding claims, characterized by the fact that the non-absorbent layer between the absorbent layer and the upper impermeable layer is not connected with the other layers.



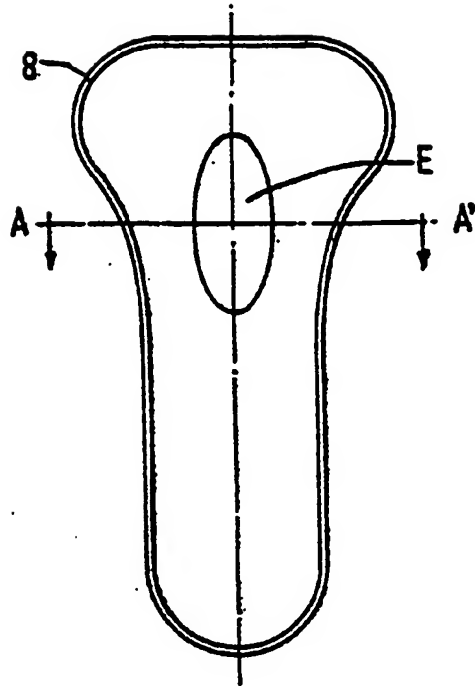


FIG. 1

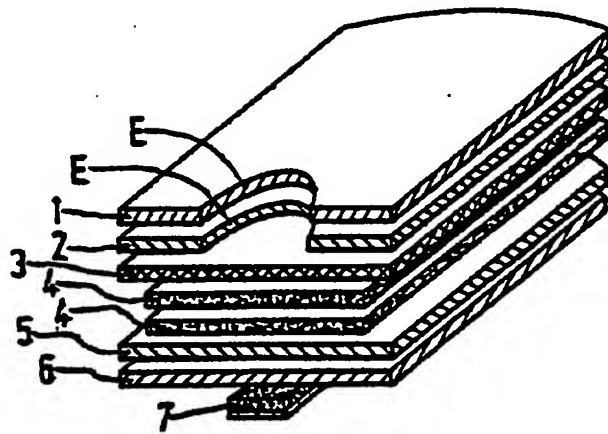


FIG. 2

European  
Patent Office

0119919  
Application Number  
EP 84 40 0511

### EUROPEAN SEARCH REPORT

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. <sup>3</sup> )
Y,D	BE-A- 893 697 (BEGHIN-SAY) * Page 5, line 20-page 6, line 7; page 7, lines 9-16, 30-32; Figures 3, 4, 10, 13 *	1-6,10	A 61 F 5/44 A 61 F 13/18
A	---	7,11	
Y	US-A-4 360 022 (USAMI et al.) * Column 2, lines 13-20, 52-62; Figure 5 *	1-6,10	
A	---	12	
A,D	US-A-3 665 920 (DAVIS) * Column 3, lines 24-27; Figure 3 *	1	
A	US-A-3 805 790 (KACZMARZYK et al.) * Column 3, lines 10-22; figures *	1,9	
A	US-A-4 072 151 (LEVINE) * Column 3, lines 26-31 *	1-4	TECHNICAL FIELDS SEARCHED (Int. Cl. <sup>3</sup> )
A	US-A-4 077 410 (BUTTERWORTH et al.) * Column 6, lines 4-20; column 4, lines 44-47; Figure 3 *	1,2,11	A 61 F
A	US-A-3 441 025 (RALPH) * Column 1, lines 25-29; figures *	1	
A	FR-A-1 170 636 (DU PONT DE NEMOURS & CO.) * Abstract, point A *	1,5,6	
The present search report has been drawn up for all claims.			
Place of search The Hague		Date of completion of the search June 13, 1984	Examiner J. Glas
<b>CATEGORY OF CITED DOCUMENTS</b> X: Particularly relevant if taken alone. Y: Particularly relevant if combined with another document of the same category. A: Technological background. O: Non-written disclosure. P: Intermediate document. T: Theory or principle underlying the invention. E: Earlier patent document, but published on, or after the filing date. D: Document cited in the application. L: Document cited for other reasons. ..... &: Member of the same patent family, corresponding document.			